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BEFORE THE BOARD OF PATENT APPEALS

AND INTERFERENCES

Paper No. 12

Application Number: 09/582760

Filing Date: June 30, 2000

Appellant(s): Tighe et al

Stanley C. Spooner

For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed June 3, 2002.

(1) ***Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

(2) ***Related Appeals and Interferences***

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) ***Status of Claims***

The statement of the status of the claims contained in the brief is correct.

(4) ***Status of Amendments After Final***

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 1-10 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

2,585,480	Makhonine	Feb. 12, 1951
5,321,945	Bell	June 21, 1994

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

2. Claims 1-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Makhonine in view of Bell .

Makhonine shows all the details of fuel balancing in the wing to alleviate wing loads except for the automati control. Makhonine in col states: In the modification illustrated in Fig. 2, the

> wing a secured to the central fuselage b is provided with two inner reservoirs f, located in front of the landing gear e, and g located adjacent to the marginal ends of the wing. The reservoirs in each wing are connected through pipes h and I in which are inserted pumps j and k. After taking off, the pumps j pump fuel out of the reservoirs f and transfer it through the pipes h, into the reservoirs g that were empty during the running of the aircraft over ground. Conversely the liquid contained inside the reservoirs g is again transferred into the reservoirs f through the pumps k and the pipes I when landing.

Makhonine in col 2 teaches that the fuel is transferred to the outboard tank after take off and back to the inboard tank before landing so that the weight is not in the wing tip during running on the ground. The pilot senses when the plane takes off and operates the pumps and the pilot senses when the plane is about to land and operates the pumps.

Bell teaches as is well known that things which may be done manually can be made to be automatic through the use of computers. Bell in columns 1 and 2 states:

> Fuel tank balance is desired for a number of reasons. Maintaining

the balance minimizes the stress applied to the aircraft structure. Keeping the tanks in balance assists in controlling the aircraft center of gravity, which in turn determines how efficiently the aircraft flies with the corresponding cost savings.

(5) Present day solutions to the above identified problem are handled simply by including an additional crew member, a second officer (also known as the flight engineer), working in the cockpit to monitor the fuel system via various indicator lights and gages. At the flight engineer work station, all the switches, meters, . . . are available to permit the flight engineer to turn on/off the pumps, valves, . . . and allows the monitoring of the flow, pressures, quantities of the fuel in the system. Based on the current operating conditions, the flight engineer's knowledge of the system, and established operating procedures, the flight engineer recognizes certain conditions, e.g., the fuel tanks are out of balance. The flight engineer determines which pumps need to be turned on, which valves need to be opened, . . . in order to correct the condition. When the quantities in the tanks reach the levels desired by the flight engineer, the pumps and valves are shut down. The fuel tanks are now balanced as desired by the flight engineer. This present day system is oriented towards a human flight engineer who has detailed knowledge of the system, and extensive training and experience on how to

operate the system. The flight engineer is intuitively aware of the aircraft flight regime, and is capable of interpreting all instructions from the other flight crew members or radio communications, is capable of reading and interpreting the aircraft log book, and seeks additional information and guidance from the flight crew, maintenance personnel, aircraft dispatcher, radio communications, and operating manuals when deemed necessary, and is capable of making subjective evaluations from other information available.

(6) In order to reduce aircraft operating costs, it is desired that the crew be reduced by eliminating the flight engineer. **Thus there is a need to have an automated system which performs as closely as possible the functions of the flight engineer in an automated fuel distribution system predictably, reliably, and consistently.** It is understood that the use of the terms "maintaining" and "balancing" as used herein (e.g., maintaining fuel levels or balancing fuel levels in the fuel tanks) is intended to be inclusive in the overall controlling function (i.e., controlling fuel transfer) performed by the present invention.

Bell teaches an automated system which performs as closely as possible the functions of the flight engineer in an automated fuel distribution system .

Bell further states in col 4 lines 43-46:

Referring to FIG. 2, there is shown a functional flow diagram of the

method of the present invention performed by a controller 50 of the distributed fuel system of FIG. 1. Based on data received from systems external to the distributed fuel system 1, aircraft and system status is determined (block 800). The input data received by the processor 50 includes aircraft inputs and fuel system inputs and includes such values as flight configuration (e.g., **airspeed, altitude, landing gear position**, . . .) fuel quantities, pump/valve position feedback, ... Based on the status information, an evaluation is made to determine which functions need to be accomplished by the controller 50 during the current processing cycle, and the functions are selected (block 805). The functions include:

a. Supplying fuel to engines requiring fuel,

b. **Fuel transfers to maintain proper fuel distribution,**

c. Fuel transfers to correct or adjust for failures within the fuel system,

d. **Fuel transfers to control the aircraft center of gravity,**

e. **Fuel transfers to comply with the aircraft operating limitations, .**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the fuel balancing system of Makhonine automatic with a processor and sensor input means as taught in general by Bell since it will provide for automatic control in place of human control. Such an obvious system would replace the pilot sensed situations of takeoff and landing with mechanical means such as landing gear sensing for takeoff and an approaching altitude or distance from ground (which is part of a preprogrammed path) for approaching landing (which Bell states are well known inputs to an automatic fuel control for a fuel transfer to comply with aircraft operating limitations). The processor 50 of Bell being a computer operates on some algorithm. All this would be motivated as stated by Bell to take the human action out and be replaced by an automated system to provide predictably, reliably, and consistency.

Makhonine in col 2 second paragraph describes the steps set forth by applicant but without the automatic action and this has long been held to be an obvious modification. The pilot senses that the plane takes off and transfers the fuel and he senses when the plane is going to land (approaching the destination) and transfers the fuel and to provide some automatic means to do, this is merely the use of modern technology.

In re Venner , 262 F.2d 91, 120 USPQ 193, 194 (CCPA 1958) (Appellant argued that claims to a permanent mold casting apparatus for molding trunk pistons were allowable over the prior art because the claimed invention combined "old permanent - mold structures together with a timer and solenoid which automatically actuates the known pressure valve system to release the inner core after a predetermined time has elapsed." The court held that broadly providing an automatic or mechanical means to replace a manual activity which accomplished the same result is not sufficient to distinguish over the prior art.).

*(11) **Response to Argument***

Appellant's arguments have been addressed in the body of the above rejection.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Galen Barefoot

glb

December 6, 2001

Conferees

Charles Jordan and Peter Poon